Jim C

Courtesy info
From MARCOR

Recommended Procedures for Residential Removals

Soil Removal

Prior to starting work inside of a residence in Libby, any contaminated soil or debris should be removed from gardens and adjacent areas leading to the home. This will prevent personnel from tracking tremolite fibers into future work areas. In addition, it will provide a clean staging area outside the home, prior to removal of Zonolite Insulation from the homes interior.

The method by which soil will be removed from the various properties in Libby will be dictated by its proximity to adjacent residential structures. When residential removals begin in earnest, I assume we will address the homes a neighborhood at a time, effectively eliminating the concern of residents living in a structure adjacent to our work area. The homes slated this year for removal are not grouped in any particular order. In some instances these homes are in the middle of crowded residential neighborhoods. Again, this factor will be eliminated next year when house are grouped by blocks, but for this year, our removal of soil will be accomplished using one of the following methods.

1. Bulk Soil removal – No containments, visual barriers with misting system utilized
2. Outdoor Containments – imploring a series of small enclosures, soil will be removed utilizing special equipment to limit CO emissions, and grain bags.

The second method will be used only as a last resort, a resident refusing to relocate, too many residents to relocate, etc.

Bulk Soil Removal

Prior to removal activities the yard will be thoroughly characterized using the soil sampling data from CDM. Excavation limits including digging depth will be determined using this data (John, I would love to and overhead diagram of a yard with lines indicating our digging limits and our depth). This diagram will be presented to the removal contractor days in advance of the removal.

When the removal is slated to begin we will begin by setting up the residence for our soil removal. Areas where digging will occur will be thoroughly saturated with water. Visual barriers comprised of 12' high fence paneling with visqueen will be used to define our exclusion zone. The tops of these panels will be fitted with a misting system designed to produce water droplets best suited to entrain asbestos fibers. A clean area inside of the exclusion zone will be designated for loading trucks. Most often this area will be on the existing driveway of the residence. If for some reason the driveway is contaminated, filter fabric will be placed on the driveway followed by clean gravel to make a clean staging area.

Outdoor Containments
Unless Mr. Peronard and Duc back off their fear of 1 fiber we will be forced to remove soil in a rather slow and monotonous process. This removal technique would use a series of containments, and grain bags to remove the soil. The bid you just received from KUO is priced for bulk removal. In the interest of being thorough, I will briefly describe the process.

First the property would be divided into sections based on its size and planned removal depth. Then the first area would be fully contained using fence panels and 6-mil fire retardant poly. A special mini excavator equipped with a CO scrubber would be used inside of the containment to load soil directly into 1 yd^3 grain bags. The bags would then be transferred outside of the containment where an awaiting fork truck would remove the grain bag from the tri-wall box or fabricated 1 yd^3 box and load it into a staged 10 wheel dump truck. Once the truck was filled it would be sent towards the mine.

Bulk Soil (continued discussion)
After set up of the work area is completed, routes for emergency egress from the working area will be discussed with on-site personnel, and truck routes for entry and egress from the exclusion zone will be discussed with the truck drivers. Removal of soil will commence when CDM finishes the site-specific hazard evaluation and turns it over to the MARCOR PM or Superintendent.

Soil will be wetted thoroughly using garden and/or fire hoses during digging and loading. Poly will be draped on the side of the truck to prevent contaminated material from coming into contact with the trucks body or tires. Once the truck is full, the tarp will be pulled over the load and secured with bungee cords to the body of the truck. The truck will then exit the exclusion zone and head to the Amphitheatre (I am assuming that the 1 ½ miles leading to the amphitheatre will be paved before soil is hauled, and if this location is picked for staging of the soil because we need to wait for the removal action at the Flyway), or the top of the mine.

If the truck drives to the amphitheatre to drop contaminated soil we will be able to fashion a design for the offloading of this truck to prevent it from touching contaminated soil, and therefore requiring decontamination at ½ mile decon station. If the soil is driven to the top of the mine, each truck will require decontamination. If this is the plan, then the 1-½ miles of road should not be paved (it would be a waste of time and money). Instead hauling could commence immediately; as long as the proper resources were allocated to the ½ mile decon station for cleaning the trucks.

The second option (hauling soil straight to the mine) may sound like the easiest and most cost effective option. However, the ½ mile decon station presents a bit of a problem. Unlike the removal action last year, we will not have thousands of tons of soil delivered to the top of the mine each day. Last year during peak times, we had over 140 loads delivered to the top of the mine. This also equates to 140 washing events at the decon

station during that day. This is plenty of work to keep a 5-6-man crew working 10 hours per day. However, the residential projects will yield smaller quantities of soil. Furthermore, fewer trucks will be used at each site. This will greatly reduce the amount of trips each truck takes per day, thus reducing the amount of washing events that occur at the ½ mile decon station.

With all of this being said, I recommend the following:

1. Pave the 1 ½ mile section of road leading to the amphitheatre with 4" of good asphalt (this road will be used plenty over the next 5 years, and will have to survive 5 MT winters, plan on maintenance and or warranty on the paving)
2. Design the paving project so that the amphitheatre is turned into a transfer station. Imagine trucks having the capability to deliver soil to the amphitheatre with out requiring decon, and using a couple of large ADT's to transfer soil from this point to the top of the mine. By doing this you have eliminated the redundant daily task of washing trucks and saved it for a final cleaning event at the end of the project.
3. Staffing needs are reduced by eliminating the ½ mile decon station. Also the money spent on delivering soil to the top of the mine is reduced. The round trip the ADT will have to make is cut by 25%. A wheel loader and a water truck will be used at the amphitheatre to load contaminated soil. Loads will not have to be tarped (to reduce fiber release from an uncovered load we can spray the load with some type of encapsulant before it departs for the top of the mine) before heading up to the mine. At the top of the mine the soil will be off-loaded and a large bulldozer in tandem with a large water truck can be used to place the soil in lifts.
4. Because residential removals will begin prior to the ½ mile of road being paved, have the soil loaded into close top containers and stage them at Lincoln County Landfill, or on the ½ mile of road on Rainy Creek that is paved. Remember, the daily rental on one of these boxes is $10. Each 20 yd^3 box can hold about 11 yd^3 of soil. The 6 sites slated for removal should add up to about 2500 yd^3 of contaminated soil, this equates to 228-20yd^3 boxes for these six sites! Keep in mind, you will only need this many boxes until the paving is completed (have KUO or Salud sub it out so it happens fast, it should be around 175K) When the paving is finished the boxes can be emptied and returned.

Remove Vermiculite

Now that all of your contaminated soil has been removed from the yard, it is time to start the challenging portion of residential removals. Your first step will be to determine where the vermiculite insulation is located (Is it in the walls, attic, etc). This information will be provided by either CDM or PES in the form of a written report. This report will be given to the MARCOR Project Manager prior to commencing any work at the site. In addition, a site walk (conducted a t the very beginning of the project) will be conducted to determine egress and entry points to the attic, the type of HVAC system in the home,

and to evaluate if it is feasible to remove the material from the exterior. The activities that follow will be virtually identical to the activities conducted during Class I Asbestos Abatement.

Class I Removal

The attic will be set up for entry. Before removal begins, I will need to know if the material is also in the walls. If so, it may alter the set up of the house. If Vermiculite is confined to just the attic, then set up of the attic will entail the following steps:

ATTIC ONLY

1. Identify Points of entry – as a rule an attic is considered a confined space unless a minimum of 2 points of egress is available. When possible, we will use existing entry points. Some instances may require installation of an additional entry point.
2. Prepare attic for Abatement - floorboards and lights will be placed throughout the attic. When entering the attic, all personnel will be required to don level C protection (even during set up). Criticals will be sealed with 2-layers of 6-mil fire retardant poly, attic walls covered with 2-layers of 6-mil fire retardant poly, vacuum hoses and negative air machines will be installed into the space. A portable shower equipped with a 2-stage decon will be installed and the entrance of the containment for personnel decon
3. Identify HVAC – depending on the system, this will need to be removed in part or in it's entirety to eliminate a potential route of exposure. Some units may require only the removal of the filters and the ducting, while others may require complete removal. Either way, part of the information I need to receive prior to starting one of the homes is the type of HVAC system the homes use. I am assuming this will be included in the report/scope I receive from CDM.
4. Smoke Test – once set up is complete, PES will inspect the containment and perform a smoke test. This will ensure fibers stay inside of our containment, and that air is being exchanged in the space at an acceptable rate.
5. Remove Contaminated items – anything in the attic will be considered ACM. Clothing or misc. textiles will be disposed of as ACM. If fiberglass is resting over the material it too will be bagged and disposed of as ACM. Abatement will commence when these items have been removed from the space.
6. Asbestos Abatement – the materials will be misted with amended water while a technician is vacuuming up the material. Material will be removed in this fashion until all visible materials have been removed. Smaller vacuums will be used for detailing in conjunction with wet wiping. Once the supervisor determines that removal efforts are complete, he will notify PES to begin their visual inspection. Upon passing visual inspection, MARCOR Personnel will apply encapsulant through out the space to knock fibers down in the space. The space will be allowed to sit for 6-hours (minimum) and then PES will begin their Clearance Samples.
7. Passing Clearance Samples – Engineering controls are removed, and the attic is ready for re-insulation.

If vermiculite insulation material is present in the attic and the walls, set up of the work area will entail the following steps:

ATTIC & WALLS

1. Identify Points of entry – as a rule an attic is considered a confined space unless a minimum of 2 points of egress is available. When possible, we will use existing entry points. Some instances may require installation of an additional entry point.
2. Prepare attic for Abatement - floorboards and lights will be placed throughout the attic. When entering the attic, all personnel will be required to don level C protection (even during set up). Criticals will be sealed with 2-layers of 6-mil fire retardant poly, attic walls covered with 2-layers of 6-mil fire retardant poly, vacuum hoses and negative air machines will be installed into the space.
3. Identify HVAC – depending on the system, this will need to be removed in part or in it's entirety to eliminate a potential route of exposure. Some units may require only the removal of the filters and the ducting, while others may require complete removal. Either way, part of the information I need to receive prior to starting one of the homes is the type of HVAC system the homes use. I am assuming this will be included in the report/scope I receive from CDM.
4. Prepare walls for abatement (after attic is set up) – when possible vermiculite insulation inside of the walls will be accessed from the homes exterior. CDM will inventory the plants and flowers with in an 8' perimeter of the house (for restoration purposes). Plants, shrubs, trees, etc., will be removed to provide an 8' corridor around the walls to be abated. A containment will be set up around the perimeter of the home using fence panels and 2-layers of 6-mil fire retardant poly. Criticals will be sealed with 2-layers of 6-mil fire retardant poly, exterior walls covered with 2-layers of 6-mil fire retardant poly, vacuum hoses and negative air machines will be installed into the space. A portable shower equipped with a 2-stage decon will be installed at the entrance of the containment for personnel decon
5. Smoke Test – once set up is complete, PES will inspect the containment and perform a smoke test. This will ensure fibers stay inside of our containment, and that air is being exchanged in the space at an acceptable rate.
6. Remove Contaminated items (from attic) – anything in the attic will be considered ACM. Clothing or misc. textiles will be disposed of as ACM. If fiberglass is resting over the material it too will be bagged and disposed of as ACM. Abatement will commence when these items have been removed from the space.
7. Access vermiculite inside the walls – most homes will have paneling over plywood. The paneling will be removed and disposed of as construction debris first. Next we will remove the plywood to access the vermiculite. This material will be treated as ACM since it was in direct contact with the contaminated material. The material should now be falling onto the floor of our containment. In areas/sections of the wall where the material does not

pour out, we will assume a fire stop is present and access the material from the attic. If the material has to be accessed form the interior of the home, all of the furniture will be moved out of the house and stored in connex boxes. A containment will be built on the inside oerimeter similar to the oone described outside.

8. Asbestos Abatement – the materials will be misted with amended water while a technician is vacuuming up the material. Material will be removed in this fashion until all visible materials have been removed. Smaller vacuums will be used for detailing in conjunction with wet wiping. Once the supervisor determines that removal efforts are complete, he will notify PES to begin their visual inspection. Upon passing visual inspection, MARCOR Personnel will apply encapsulant through out the space to knock fibers down in the space. The space will be allowed to sit for 6-hours (minimum) and then PES will begin their Clearance Samples.
9. Passing Clearance Samples – Engineering controls are removed, and the attic and walls are ready for re-insulation.

Final Cleaning

If the home had vermiculite in the soil, attic, or walls of the home, a bulk of this material is now gone. Of course we know that 100% of the material will not be removed from the homes, some will remain when we have finished our work. However the home is a much better place to live in than before we started. We will also take additional precautions to ensure any remaining material is encapsulated by our replacement insulation.

My recommendations on this final cleaning event are as follows:

1. If the home was below the dust level set as an action level than a final cleaning is **not** required. Even if the home has vermiculite in the walls, attic, and yard, I still feel the appropriate action is nothing. We will be monitoring the living space during the removal action to ensure and to document that no fibers have been released to the living space.
2. If the home was above the dust action level, then my technicians will perform a final cleaning in the living space. Negative air machines (several) will be placed throughout the home to scrub the air, and a portable shower with 2-stage decon will placed at the entrance of the home. Technicians will enter the space in level C and HEPA Vacuum the horizontal and vertical surfaces in conjunction with wet-wiping techniques. This effort will last for 2-3 days depending on the size f the home.
3. If the home has dust above the action level, but no vermiculite in the soil, walls, or attic, we will perform the same cleaning event listed above in the home. In addition, I would recommend the removal of the HVAC system (if applicable) in this type of home as an additional safety precaution.

Of course your last problem is getting some type of valid sample at the end of this final cleaning event. I suggest using the personal samples from my technicians as your

sampling device. My Technicians cleaning efforts will simulate standard household activities. If they are below our clearance for the project (has yet to be set), then we are done and we can leave. If they are above, we will have to re-clean and re-sample.